# 8 TRAFFIC AND TRANSPORTATION

This chapter includes a detailed analysis of traffic operations related to the project. The analysis includes project trip generation and distribution, intersection level of service analysis with and without the project, vehicle miles of travel calculations, and access and circulation evaluation.

# 8.1 ENVIRONMENTAL SETTING

### 8.1.1 ROADWAY SETTING

Exhibit 8-1 shows the existing applicable roadway segments and intersections that provide access to the proposed project sites. The major roadways included in the analyses are described as follows:

- ▲ Interstate 80 (I-80) is an east-west highway that is intersected by State Routes (SR) 89 and 267 in Truckee, California. Near the project area I-80 has two lanes in each direction with deceleration lanes at interchanges. The speed limit on I-80 between SR 89 and SR 267 is 65 mph.
- ▲ State Route (SR) 89 is generally a north-south highway that intersects I-80 in Truckee, California and SR 28 in Tahoe City, California. SR 89 is the primary roadway that borders the west side of Lake Tahoe south of the SR 89/SR 28 intersection.
- ∠ Cabin Creek Road provides access to the Eastern Regional MRF and Transfer Station from SR 89. Cabin Creek Road is a two-lane roadway west of SR 89.

The following study intersections were included in the analysis of the project site:

▲ SR 89/Cabin Creek Road

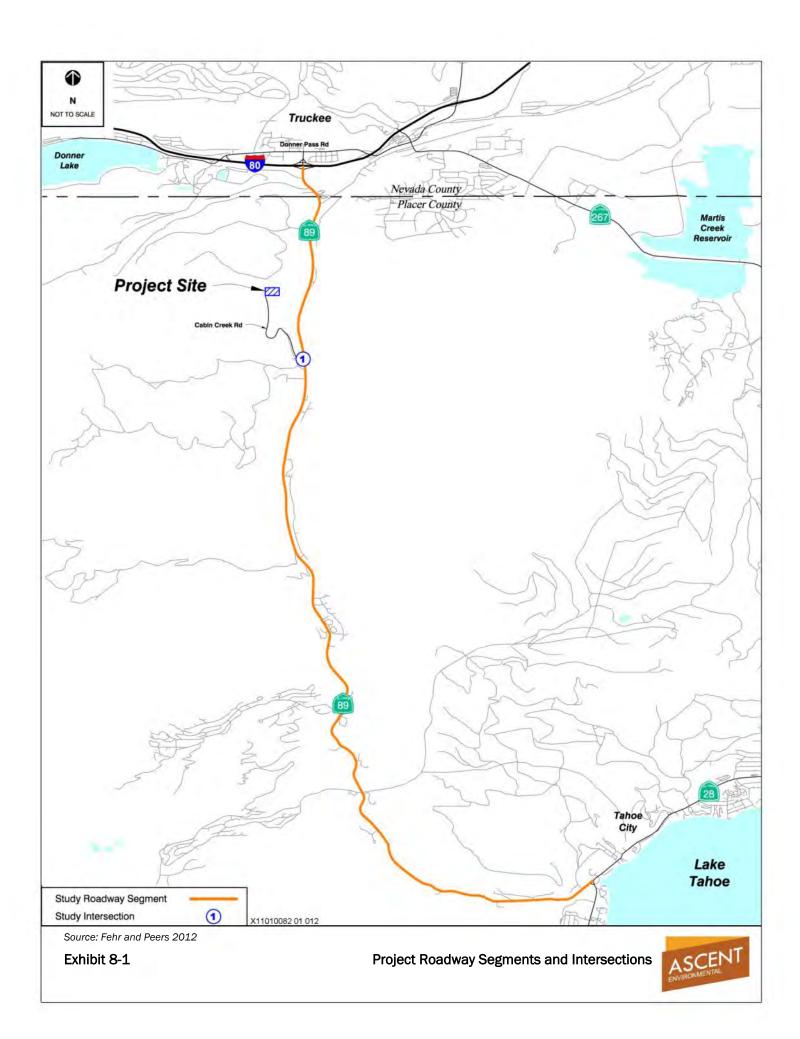
# 8.1.2 EXISTING TRAFFIC VOLUMES

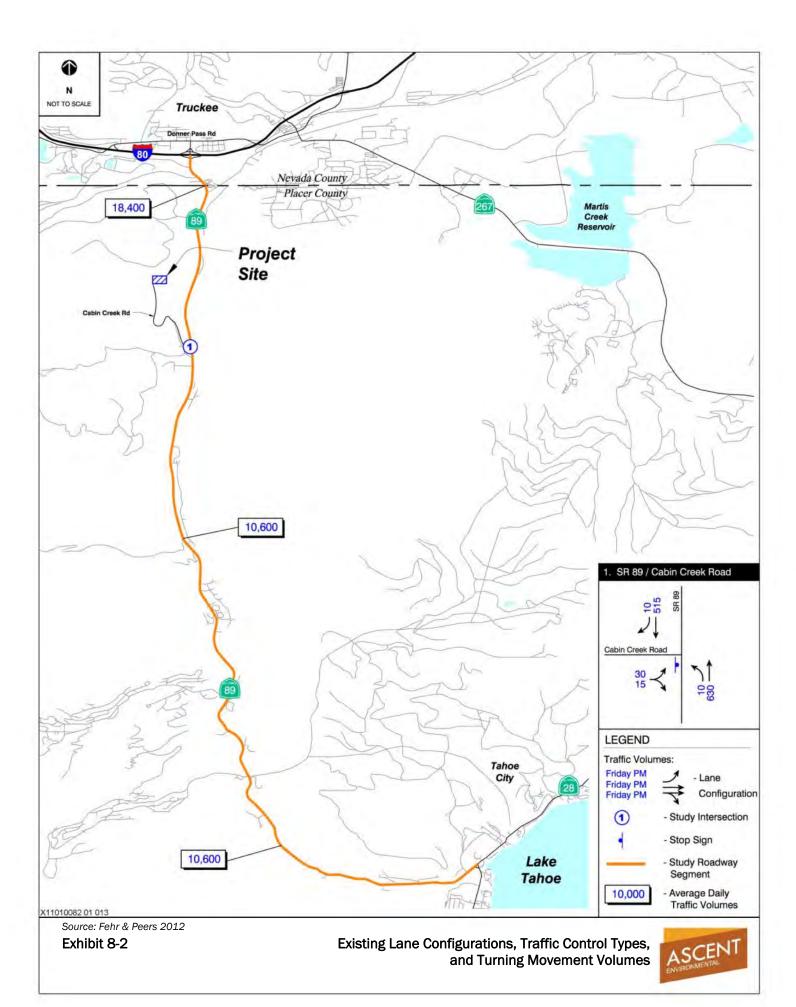
Two-way daily and peak hour traffic volume data was collected from April 28, 2011 to May 2, 2011 on Cabin Creek Road west of SR 89. The most recent available (2010) daily and hourly traffic volumes on SR 89 were obtained from the Caltrans Traffic and Vehicle Data Systems Unit. The data was used to determine the existing weekday peak hour turning movement volumes at the SR 89/Cabin Creek Road intersection. Based on the volume data, the Friday PM peak hour (4:00 PM to 5:00 PM) was determined to have the highest traffic volumes in the project area.

Table 8-1 shows the existing intersection turning movement volumes at the study intersection for the Friday PM peak period. Existing intersection lane configurations, traffic control types, and turning movement volumes are shown on Exhibit 8-2.

Table 8-1 Existi	ng Intersection Turning Movement Volumes – Friday PM Peak Hour						
	Tuming Movement Volume						
Intersection	Northbound Left Turn	Northbound Through	Southbound Through	Southbound Right Turn	Eastbound Left Turn	Eastbound Right Tum	
SR 89/Cabin Creek Road	10	630	515	10	30	15	

Notes: Two-way daily and peak hour count data collected in April 2011, along with Caltrans traffic volumes, were balanced to obtain intersection turning movement counts. Raw count data is provided in Appendix C. Source: Fehr & Peers, 2012

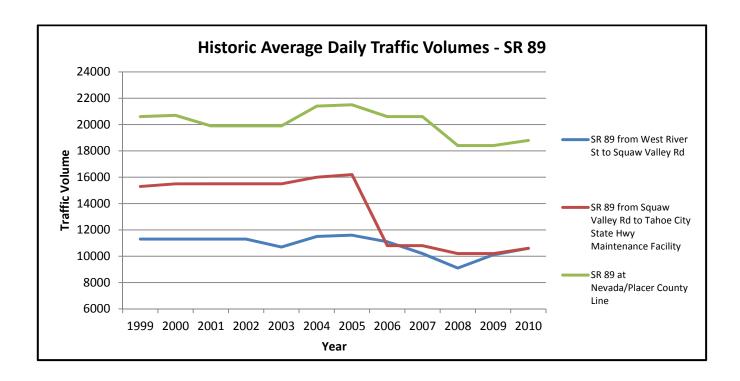




#### HISTORIC TRAFFIC VOLUMES

Table 8-2 illustrates annual daily traffic (ADT) volumes from 1999 to 2009 on SR 89 near the project site. As shown in the table and graph below, ADT volumes on SR 89 have decreased by approximately 0.7% to 3.2% per year during the ten year period. Between 2000 and 2010, traffic volumes on SR 89 near the project site fell by an average of 23%.

	Table 8-2 Historic Average Daily Traffic Volumes											
Segment	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	Average Annual Growth
SR 89 at Nevada/Placer County Line	20,700	19,900	19,900	19,900	21,400	21,500	20,600	20,600	18,400	18,400	18,800	-0.70%
SR 89 from Squaw Valley Rd to Tahoe City State Hwy Maintenance Facility	15,500	15,500	15,500	15,500	16,000	16,200	10,800	10,800	10,200	10,200	10,600	-3.16%
SR 89 from Tahoe City State Hwy Maintenance Facility to Tahoe City Jct. Rte. 28	15,500	15,500	15,500	15,500	16,000	16,200	12,700	12,700	12,000	10,800	10,600	-3.16%
Source: Caltrans Traffic	Data Bran	ch, 2010						•			•	



### 8.1.3 EXISTING TRAFFIC CONDITIONS

#### INTERSECTION OPERATIONS

Transportation engineers and planners commonly use the term level of service (LOS) to measure and describe the operational status of the local roadway network. An intersection or roadway segment's level of service can range from LOS A (indicating free-flow traffic conditions with little or no delay), to LOS F (representing oversaturated conditions where traffic flows exceed design capacity, resulting in long queues and delays).

#### **UNSIGNALIZED INTERSECTIONS**

Unsignalized (side street stop controlled) intersection LOS analysis was performed using the methodology in Chapter 17 of the *Highway Capacity Manual (HCM) 2000*. The *HCM 2000* methodology determines the LOS at unsignalized intersections by comparing the average control delay for each individual movement to the delay thresholds shown in Table 8-3.

	Table 8-3 Intersection Level of Service Definitions	
Level of Service	Description	Unsignalized Intersections (Average Control Delay)
А	Represents free flow. Individual users are virtually unaffected by others in the traffic stream.	<10 sec/veh
В	Stable flow, but the presence of other users in the traffic stream begins to be noticeable.	> 10 to 15 sec/veh
С	Stable flow, but the operation of individual users becomes significantly affected by interactions with others in the traffic stream.	> 15 to 25 sec/veh
D	Represents high-density, but stable flow.	> 25 to 35 sec/veh
Е	Represents operating conditions at or near the capacity level.	> 35 to 50 sec/veh
F	Represents forced or breakdown flow.	> 50 sec/veh
Sources:	HCM 2000, Chapter 17, Unsignalized Intersections. Values shown are in seconds/vehicle.	

LOS D was used as the standard for the SR 89/Cabin Creek Road intersection based on Caltrans and Placer County standards.

#### **EXISTING INTERSECTION LEVEL OF SERVICE**

Intersection level of service analysis was performed at the study intersections using Synchro computer software which utilizes *HCM 2000* methodology. Table 8-4 shows the existing conditions, PM peak hour intersection level of service results. The LOS calculations sheets are provided in Appendix C.

Table 8-4	Existing Interse	ction Level of Service Resu	ılts	
Intersection	Control Type <sup>1</sup>	Friday PM Peak Hour		
Intersection	Condoi type <sup>2</sup>	Delay <sup>2</sup>	LOS	
SR 89/Cabin Creek Road	SSSC	1.1 (27.0)	A (D)	
Notes: <sup>1</sup> SSSC = Side Street Stop Control <sup>2</sup> Delay is reported in seconds per v Sources: Fehr & Peers, 2012	rehicle for the overall intersecti	ion (worst movement) for unsignalize	ed intersections.	

As shown in Table 8-4, the overall intersection LOS is A and the Cabin Creek Road approach operates at LOS D.

### 8.1.4 EXISTING GROUND TRANSIT FACILITIES

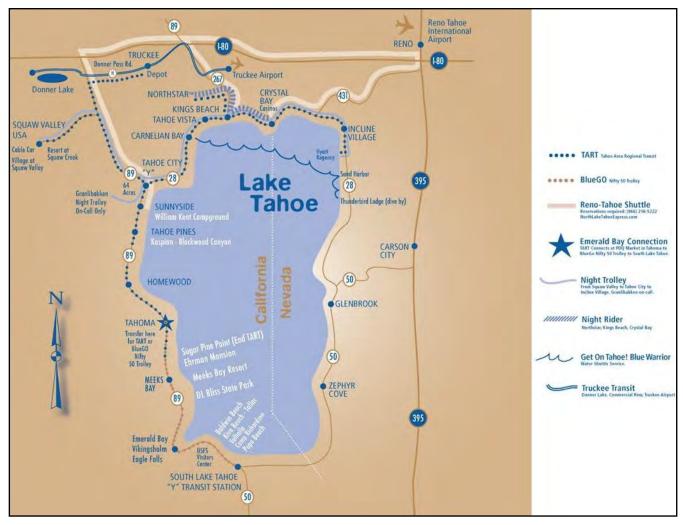
The Tahoe Area Regional Transit (TART), which is operated by Placer County, provides hourly bus service along the north and west shores of Lake Tahoe seven days per week. Routes run from 6:00 AM to 7:00 PM along SR 28, SR 89, and part of SR 267. Existing ground transit facilities and routes are shown on Exhibits 8-3 and 8-4 below. No routes provide services to the project site.

The North Lake Tahoe Express provides daily airport service from 3:30 AM to 12:00 AM (midnight) from the North Lake Tahoe and Truckee region to the Reno-Tahoe International Airport in Reno, Nevada. Passengers must pay a fee for this service, and are required to make reservations in advance. The North Lake Tahoe Express offers three route lines – Red Line, Green Line, and Blue Line (shown on the winter route map, Exhibit 8-4).

### 8.1.5 EXISTING BICYCLE AND PEDESTRIAN FACILITIES

A separated shared-use trail runs through Tahoe City along SR 28 and SR 89 to Squaw Valley. SR 89 north of Squaw Valley does not have bicycle lanes or trails, but is considered a bicycle route.

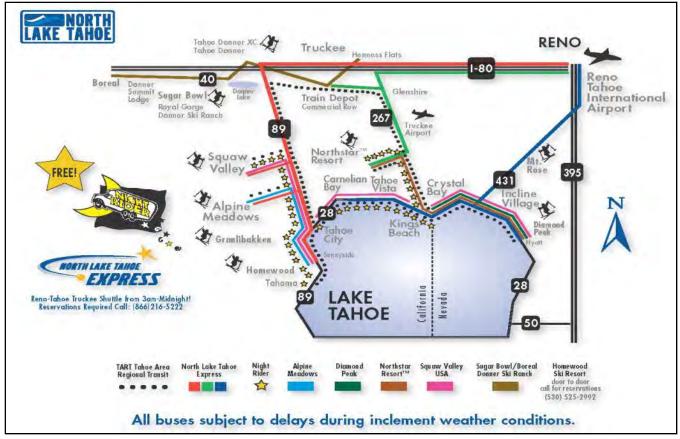
Existing bicycle and pedestrian facilities in the Tahoe Basin and Truckee areas are shown on Exhibit 8-5.



Source: www.laketahoetransit.com

Exhibit 8-3

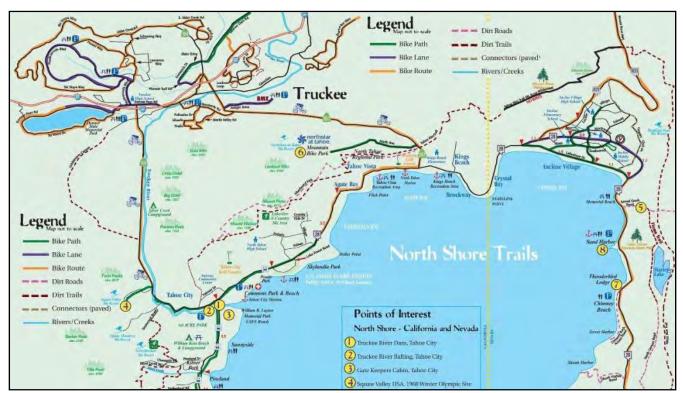
**Existing Ground Transit Facilities and Routes (Summer)** 



Source: www.laketahoetransit.com

Exhibit 8-4

# **Existing Ground Transit Facilities and Routes (Winter)**



Source: www.tahoebike.org

Exhibit 8-5

**Existing Bicycle and Pedestrian Facilities** 

# 8.2 REGULATORY SETTING

Caltrans and Placer County have regulatory authority over the transportation network in the project area. Caltrans has jurisdiction over the State highway system and Placer County provides regulations within the county. An overview of the transportation and circulation standards applicable to the project is identified below.

### 8.2.1 FEDERAL

There are no federal regulations that pertain to the project.

### 8.2.2 STATE

#### CALTRANS GUIDE FOR PREPARATION OF TRAFFIC IMPACT STUDIES

The Caltrans Guide for Preparation of Traffic Impact Studies states:

"Caltrans endeavors to maintain a target level of service (LOS) at the transition between LOS C and LOS D on State highway facilities, however, Caltrans acknowledges that this may not always be feasible and recommends that the lead agency consult with Caltrans to determine the appropriate target LOS. If an existing State highway facility is operating at less than the appropriate target LOS, the existing MOE (measures of effectiveness) should be maintained."

#### **CALTRANS DISTRICT 3**

The Caltrans District 3 Mobility Action Plan requires a concept LOS D in rural areas and LOS E in urban areas.

Caltrans has prepared Transportation Concept Reports (TCR) for each State Route (SR). The TCR defines existing level of service by segment and provides the concept (target) level of service by segment. The SR 89 TCR (Caltrans District 3, August 2001), identifies the following existing and concept levels of service for segments within the project area:

- SR 89 − Placer County/El Dorado County Line to the SR 89/SR 28 intersection in Tahoe City: Existing LOS F; 20 Year Concept LOS F.
- SR 89 SR 89/SR 28 intersection in Tahoe City to Placer County/Nevada County Line: Existing LOS E; 20 Year Concept LOS F.

Caltrans District 3 Thresholds require that measures be identified to mitigate significant impacts caused by project traffic on State highways. The following are considered to be significant impacts:

- Vehicle queues at intersections exceeding the existing storage lane length
- Project impacts that cause the highway or intersection LOS to deteriorate beyond LOS D. If the LOS is already "E" or "F", then quantitative measures of increased queue lengths and delay should be used to determine appropriate mitigation measures.

### 8.2.3 LOCAL

#### PLACER COUNTY

The *Placer County General Plan* (1994) includes the following policies related to transportation and circulation that are relevant to this analysis:

### Streets and Highways

- Policy 3.A5. Through traffic shall be accommodated in a manner that discourages the use of neighborhood roadways, particularly local streets. This through traffic, including through truck traffic, shall be directed to appropriate routes in order to maintain public safety and local quality of life.
- Policy 3.A6. The County shall require all new development to provide off-street parking, either onsite or in consolidated lots or structures.
- Policy 3.A7. The County shall develop and manage its roadway system to maintain the following minimum LOS:
  - LOS "C" on rural roadways, except within one-half mile of state highways where the standard shall be LOS "D."
  - LOS "C" on urban/suburban roadways except within one-half mile of state highways where the standard shall be LOS "D."

The County may allow exceptions to these LOS standards where it finds that the improvements or other measures required to achieve the LOS standards are unacceptable based on established criteria. In allowing any exception to the standards, the County shall consider the following factors:

- The number of hours per day that the intersection or roadway segment would operate at conditions worse than the standard.
- → The ability of the required improvement to significantly reduce peak hour delay and improve traffic operations.
- → The right-of-way needs and the physical impacts on surrounding properties.
- → The visual aesthetics of the required improvement and its impact on community identity and character.
- Environmental impacts including air quality and noise impacts.
- → Construction and right-of-way acquisition costs.
- → The impacts on general safety.
- → The impacts of the required construction phasing and traffic maintenance.
- → The impacts of quality of life as perceived by residents.
- → Consideration of other environmental, social, or economic factors on which the County may base findings to allow an exceedance of the standards.

Exceptions to the standards will only be allowed after all feasible measures and options are explored, including alternative forms of transportation.

- Policy 3.A.12. The County shall require an analysis of the effects of traffic from all land development projects. Each such project shall construct or fund improvements necessary to mitigate the effects of traffic from the project. Such improvements may include a fair share of improvements that provide benefits to others.
- Policy 3.A.15. Placer County shall participate with other jurisdictions and Caltrans in the planning and programming of improvements to the State Highway system, in accordance with state and federal transportation planning and programming procedures, so as to maintain acceptable levels of service for

Placer County residents on all State Highways in the County. Placer County shall participate with Caltrans and others to maintain adopted LOS standards as follows:

- a. For State Highways 49, 65, and 267, Placer County's participation shall be in proportion to traffic impacts from its locally-generated traffic.
- b. The funding of capacity-increasing projects on I-80 shall utilize state and federal sources intended for the improvement of the regional and interstate system such as Flexible Congestion Relief (FCR). Placer County and local development shall not be required to participate financially in the upgrading of I-80 to provide additional capacity for through traffic.
- c. Placer County assumes no responsibility for funding roadway improvements to the street system within other jurisdictions. Each local jurisdiction shall be responsible for improvements necessary to sustain adopted LOS standards within its jurisdiction limits. Placer County may negotiate participation agreements with other jurisdictions for transportation improvement projects that provide mutual benefit.

# 8.3 IMPACTS

### 8.3.1 SIGNIFICANCE CRITERIA

Based on the threshold identified in Placer County's Environmental Questionnaire and CEQA Guidelines Appendix G, a project would have a significant effect on the environment if it would:

- cause an increase in traffic which is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume to capacity ratio on roads, or congestion at intersections);
- exceed, either individually or cumulatively a level of service standard established by the county congestion management agency for designated roads or highways;
- ✓ result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks;
- substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment);
- result in inadequate emergency access;
- result in inadequate parking capacity; or
- conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks).

Based on the guidelines and thresholds set by Caltrans District 3 and Placer County, the proposed project would have a significant traffic impact if the project would:

- Cause the LOS at a study intersection to degrade from an acceptable LOS (LOS A, B, C, or D) to an
  unacceptable LOS (LOS E or F). For unsignalized intersections, the LOS is evaluated for the critical
  movement based on average vehicle delay. LOS is determined based on methodology contained in the
  Highway Capacity Manual (HCM) 2000 (Transportation Research Board, 2000);
- 2. Cause an increase in traffic at an unsignalized study intersection that warrants installation of a traffic signal or changes to existing traffic control devices;
- 3. Result in changes to parking facilities or demand for new parking that is not accommodated;

4. Disrupt existing transit services or facilities, interferes with planned transit services or facilities, creates a demand for transit above the current/planned capacity, or creates inconsistencies with adopted transit system plans, guidelines, policies, or standards;

- 5. Disrupt existing bicycle or pedestrian facilities, interferes with planned bicycle or pedestrian facilities, or creates inconsistencies with adopted bicycle/pedestrian plans, guidelines, policies, or standards;
- 6. Cause a temporary intersection LOS impact due to the presence of construction traffic;
- 7. Create vehicle circulation problems/congestion due to the design (e.g., improper driveway spacing, driveways or onsite roadways do not accommodate the design vehicle); or
- 8. Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment).

### 8.3.2 METHODS AND ASSUMPTIONS

#### TRIP GENERATION AND DISTRIBUTION

The trip generation analysis includes trucks transporting biomass material (fuel and biochar) and employees working at the site. Detailed trip generation spreadsheets are provided in Appendix C.

#### **EMPLOYEE TRIPS**

The project is expected to create a maximum nine new jobs at the biomass plant, with a maximum of three employees on shift at any one time. Electrical generation at the facility would occur 24 hours per day, with at least one employee on site at all times and up to three employees working during the day shift and one employee working during the nighttime and evening shifts. For analysis purposes, it was assumed that each employee would make four trips per day – one trip to work, one trip to leave work, one trip to go to lunch/break, and one trip to return from lunch/break. Table 8-5 shows the employee trip generation for the proposed project.

Table 8-5 Employee Trip Generation						
Land Use	Size	Daily Trips <sup>1</sup>	PM Peak Hour Trips <sup>2</sup>			
Cabin Creek Biomass Facility	5 Employees/Day	20	3			
	Total Employee Trips	20	3			

<sup>&</sup>lt;sup>1</sup> Assumes 4 trips per employee per day - one trip to work, one trip to leave from work, one trip to go to lunch/break, and one trip to return from lunch/break

Source: Fehr & Peers, 2012

The project's employees (at the plant) are expected to generate 20 daily and 3 peak hour trips.

## **BIOMASS FACILITY TRUCK TRIPS (FUEL DELIVERY)**

Based on the Fuel Blend and Sourcing (Table 3-1) provided in Chapter 3, Project Description, it was assumed that approximately 72% of the biomass material would come from inside the Lake Tahoe Basin, with the remaining 28% of the material coming from outside the Lake Tahoe Basin within a 20 -30-mile radius.

<sup>&</sup>lt;sup>2</sup> It is assumed that there are 3 "daytime" employees and 1 "nighttime" and "evening" employees. PM Peak Hour is 4-5PM, when "daytime" employees leave work; this is a conservative estimate because it is likely that the employees will be on alternating shifts and not all leaving within the same hour.

The biomass material originating in the Lake Tahoe Basin would come from three primary areas:

- West Shore Includes the west shore of Lake Tahoe and north shore areas west of Kings Beach
- East Shore Includes the east shore of Lake Tahoe and north shore areas east of Kings Beach
- ▲ South Shore Includes the area between Meeks Bay and Zephyr Cove

The Logistics Study of a Biomass Facility for the Lake Tahoe Region Task 3.0 (Proactive Customer Services, November 2011) identifies five locations around Lake Tahoe, two on the west shore and three on the east shore, where material would be collected. The study also identifies the percentage of material that is expected to come from each location. The study does not assume any material would come from South Lake Tahoe due to traffic restrictions and congested traffic lanes, and in the long term the County does not expect to serve South Lake Tahoe. However, based on direction from Placer County staff, it was assumed that initially 10% of the "in basin" material would come from South Lake Tahoe. Assuming material would come from South Lake Tahoe presents a conservative (worst-case scenario) analysis, as trips to/from South Lake Tahoe would have longer trip lengths and, therefore, generate more vehicle miles of travel (VMT) than trips from closer locations. Adjustments were made to the percentages provided in the Logistics Study for the west shore and east shore locations, to account for the South Lake Tahoe material. The biomass material from inside the Lake Tahoe Basin is split based on the following percentages (Proactive Customer Services, November 2011):

- West Shore 50.3%
- **▲** East Shore 39.7%
- South Shore 10%

"Out of basin" material is expected to come from Placer County and Nevada County via I-80, and is within 20 to 30 miles of the proposed project.

The total material origin distribution is as follows:

- In Basin 72.1%
  - West Shore 36.3%
  - East Shore 28.6%
  - ✓ South Shore 7.2%
- Out of Basin 27.9%

To determine the number of trips generated by delivery trucks, the number of loads of material was first determined based on the amount of biomass material needed to run the plant and the size of the trucks used to haul the material. The project would use gasification processing which is estimated to use up to 17,000 Bone Dry Tons (BDT) of material per year. Based on coordination with Placer County staff, it was also assumed that a typical size chip van (12.5 BDT) would be used to transport all material. Table 8-6 provides an estimate of the number of loads of material required to run a 17,000 BDT gasification plant.

Ta	able 8-6	Delivery Estimate
		Proposed Project (Gasification Processing)
Bone Dry Tons (BDT) per Year		17,000
Truck Size (Cubic Yards)		93
Cubic Yards per BDT		7.41
Truck Capacity (BDT)		12.5
Total Truck Loads per Year		1,360
Source: Fehr & Peers, 2012		

The forest thinning season, when biomass material is collected from locations around Lake Tahoe, is limited to the dry seasons. For analysis purposes it was assumed that all material would be collected from May 1 to October 15, to coordinate with Lake Tahoe's construction season. However, collection may occur outside this window, which would ultimately reduce the total daily truck trips because the same volume of material would be collected. The material collection period will be referred to as "summer" for the remainder of this chapter. Because material would not likely be collected during the remainder of the year (October 16 to April 30), a sufficient supply would need to be stored onsite for continual operation of the biomass plant during the "winter" season. For occasions when a back-up winter supply is needed, fuel would be obtained from the existing Eastern Regional MRF operations. These materials are already being delivered to the Eastern Regional MRF for processing under the current solid waste facilities permit; therefore, no new trips would be generated for the back-up winter supply.

The trip generation of the project has been analyzed for the "summer" and "winter" seasons. In order to develop a conservatively high estimate of maximum daily vehicle activity, this analysis assumed that the plant would operate 365 days per year, and all fuel deliveries would occur over 120 days during the summer (between May 1<sup>st</sup> and October 15<sup>th</sup>). As discussed, all 17,000 BDT needed to operate the plant would be collected during the summer period and would be delivered to the project site for gasification processing or storage for winter months.

The majority of delivery truck trips would be generated during the summer. Because the processing plant and material storage are located at the proposed Cabin Creek site, the winter period would not have a significant number of offsite delivery truck trips.

Table 8-7 shows the summer	delivery truck tri	n generation estimates	for the proposed project.

Table 8-7 Summer Season Delivery Truck Trip Generation							
Delivery Routes	Percentage of Material	Loads of Material	Loads per Day	Daily Trips1	PM Peak HrTrips <sup>2</sup>		
Summer Operations <sup>3</sup>							
To Cabin Creek	100%	1,360	114	22	5		
From West Shore	36.3%	493	4	8	2		
From East Shore	28.6%	389	3	6	1		
From South Shore	7.2%	98	1	2	1		
From Placer/Nevada County	27.9%	380	3	6	1		
Total Summer Trips					5		

Notes: 1 Assumes 2 trips per load (1 trip in and 1 trip out)

Source: Fehr & Peers, 2012

### **BIOCHAR REMOVAL TRIPS**

Gasification of forest-sourced woody biomass can produce approximately three to five percent biochar per volume of woody biomass input. Therefore, the 14,000 to 17,000 BDT of woody biomass used in the power generation process would yield an estimated 420 to 850 tons of biochar per year, or between 8 and 16 tons per week. Assuming approximately 800 pounds of biochar per cubic yard, the removal of biochar from the site is anticipated to require off-haul and disposal of between 20 and 40 cubic yards of biochar per week, which could be accomplished using two to four 10 cubic yard truckloads per week throughout the entire year.

<sup>&</sup>lt;sup>2</sup> Peak Hour Trips are based on a 9 hour work day. It was assumed that deliveries would be made during 4.5 hours (1/2 of the work day) and trucks would be loaded and travelling during the other 4.5 hours of the day.

<sup>&</sup>lt;sup>3</sup> Summer is considered the thinning season (May 1 to October 15). Winter is considered October 16 to April 30.

<sup>&</sup>lt;sup>4</sup> Based on 120 work days (summer).

For trip generation purposes, it was assumed that there are a maximum of four truckloads per week, and one truckload per day. Each truckload would generate two trips (one trip in and one trip out). It was also assumed that the trips would occur during the peak hour to present a conservative analysis.

#### TRIP DISTRIBUTION

### **Employee Trips**

Employees are expected to travel from Truckee and Tahoe City, and would take the route with the shortest travel distance. Employees from Truckee would take I-80 to SR 89, and employees from Tahoe City would take SR 28 and SR 89. 80% of employee trips would have destinations to/from Truckee (including lunch/break trips) and 20% would be to/from Tahoe City.

### **Delivery Truck Trips**

Delivery truck trip distribution and assignment was determined based on where the material would come from. Material would come from the following locations:

- West Shore 36.3%
- East Shore 28.6%
- South Shore 7.2%
- Placer County and Nevada County 27.9%

It is anticipated that delivery trucks would be restricted from using SR 28 between Tahoe City and Kings Beach as a regular travel route. Therefore, the following routes would be used:

- West Shore to Cabin Creek SR 89
- East Shore/South Shore to Cabin Creek US 50, SR 28, SR 267, I-80, SR 89
- Placer County/Nevada County to Cabin Creek I-80, SR 89

#### **Biochar Removal Trips**

Biochar generated at the site would either be reused in one of several non-disposal applications (e.g., charcoal, soil amendment, or as a potential bio-sequestration of carbon agent), or disposed of at an appropriately permitted facility (e.g., Lockwood Regional Landfill in Sparks, Nevada).

For analysis purposes the truck trips associated with biochar removal were anticipated to travel between I-80 and the project site via SR 89. All biochar was assumed to be disposed at the Lockwood Landfill in Nevada.

#### TRIP GENERATION SUMMARY

Table 8-8 displays the total trips that would be generated by the project. During the summer, the project is expected to generate a total of 36 daily and 10 peak hour trips including delivery truck trips, employee trips, and biochar trips. During the winter, the project would generate 14 daily and 5 peak hour trips (employee trips and biochar trips only).

Exhibit 8-6 shows the summer project trip assignment. Since the winter trip generation and existing winter traffic volumes are less than summer, the impact analysis is performed for summer conditions.

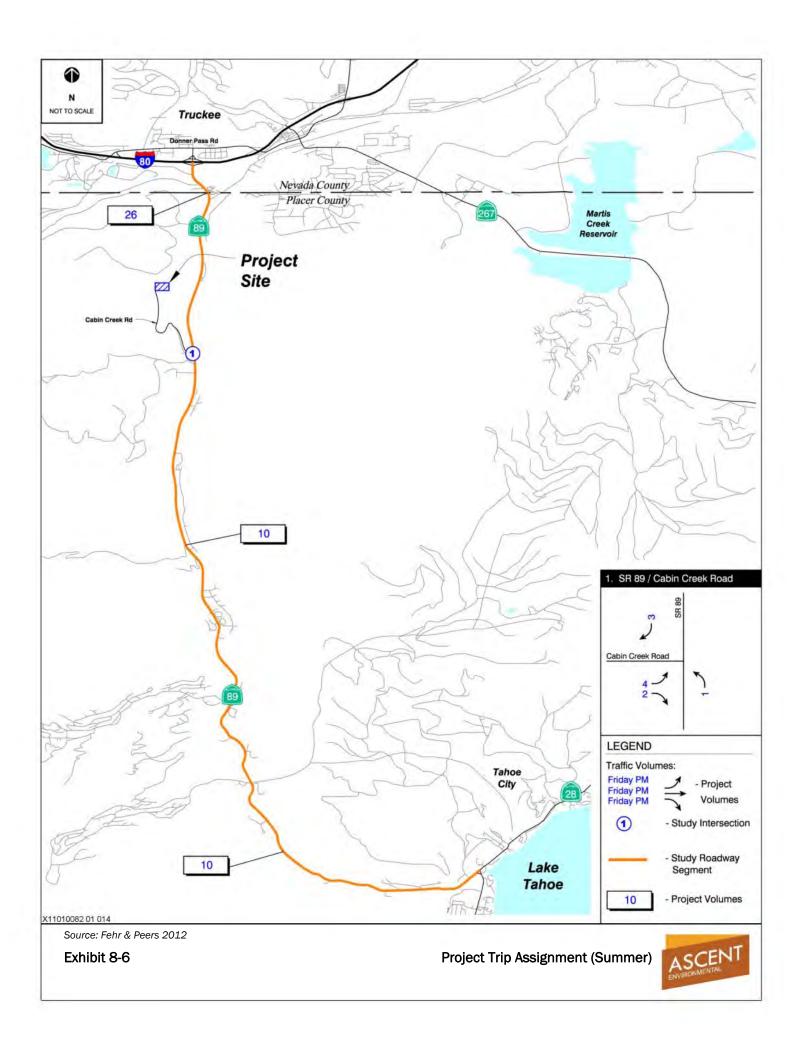


Table 8-8 Proposed Project Trip Generation Summary						
Trip Type/Route	Si	ummer	Winter			
	Daily Trips	Fri PM Peak HrTrips	Daily Trips	Fri PM Peak HrTrips		
Fuel Deliveries (Truck)	22	5	NA	NA		
Biochar Removal (Truck)	2	2	2	2		
Employees Trips (Automobile)	20	3	20	3		
Total	46	10	22	5		
Source: Fehr & Peers, 2012		•		•		

# **VEHICLE MILES OF TRAVEL (VMT)**

The project trip generation and distribution were used to analyze vehicle miles of travel (VMT) generated by the project. The trip lengths from each material collection location to the drop off site at Cabin Creek were measured using aerial photography. The distances were split to analyze VMT in the Lake Tahoe Basin and out of the Lake Tahoe Basin using an "air basin" map provided by Placer County.

Table 8-9 shows the VMT that would be generated for the proposed project. The daily, seasonal (summer and winter), and annual VMT are shown.

Table 8-9 Vehicle Miles of Travel							
Delivery Routes	Daily Trips In/Out	Trip Length In (In Basin/ Out of Basin)	Trip Length Out (In Basin/ Out of Basin)	VMT (In Basin/ Out of Basin)			
Summer Operations Summer Operations							
Deliveries to Cabin Creek							
Deliveries from West Shore to Cabin Creek (via SR 89)	4/4						
Meeks Bay FPD	3/3	22.9 (14.7/8.2)	22.9 (14.7/8.2)	137 (88/49)			
North Tahoe FPD	1/1	12.8 (4.6/8.2)	12.8 (4.6/8.2)	26 (10/16)			
Deliveries from East Shore to Cabin Creek (via US 50, SR 28, SR 267, I-80, SR 89)	3/3						
North Lake Tahoe FPD	1/1	24.3 (8.7/15.6)	24.0 (8.7/15.3)	48 (17/31)			
NV Division of Forestry	1/1	30.1 (14.5/15.6)	29.8 (14.5/15.3)	60 (29/31)			
Tahoe-Douglas FPD	1/1	47.0 (31.4/15.6)	46.7 (31.4/15.3)	94 (63/31)			
Deliveries from South Lake Tahoe <sup>1</sup> to Cabin Creek (via US 50, SR 28, SR 267, I- 80, SR 89)	1/1	58.3 (42.7/15.6)	58.0 (42.7/15.3)	116 (85/31)			
Deliveries from Placer County and Nevada County to Cabin Creek (via I-80, SR 89) <sup>2</sup>	3/3	20.0 (0/20.0)	20.1 (0/20.1)	120 (0/120)			
VN	601 (292/309)						
	Operating Days			120			
	72,120 (35,040/37,080)						

Т	able 8-9 Ver	nicle Miles of Trave	·I	
Delivery Routes	Daily Trips In/Out	Trip Length In (In Basin/ Out of Basin)	Trip Length Out (In Basin/ Out of Basin)	VMT (In Basin/ Out of Basin)
Employee Trips				
Trips from Truckee to Cabin Creek	3/3	4.5 (0/4.5)	4.5 (0/4.5)	27 (0/27)
Trips from Tahoe City to Cabin Creek	2/2	11.7 (3.5/8.2)	11.7 (3.5/8.2)	47 (14/33)
Trips to Lunch in Truckee	5/5	4.5 (0/4.5)	4.5 (0/4.5)	45 (0/45)
		VN	AT per Summer Day	119(14/105)
			Operating Days	120
			Summer VMT	14,280 (1,680/12,600)
Biochar Trips <sup>3</sup>				
Biochar Loads	1/1	53.4 (0/53.4)	53.5 (0/53.5)	107 (0/107)
		VN	AT per Summer Day	107 (0/107)
			Operating Days	120
			Summer VMT	12,840 (0/12,840)
SUMMER TOTAL				
		Total VMT per	Summer Weekday	827 (306/521)
			Total Summer VMT	99,240 (36,720/62,520)
	WinterO	perations		
Employee Trips				
Trips from Truckee to Cabin Creek	3/3	4.5 (0/4.5)	4.5 (0/4.5)	27 (0/27)
Trips from Tahoe City to Cabin Creek	2/2	11.7 (3.5/8.2)	11.7 (3.5/8.2)	47 (14/33)
Trips to Lunch in Truckee	5/5	4.5 (0/4.5)	4.5 (0/4.5)	45 (0/45)
		V	MT per Winter Day	119(14/105)
			Operating Days	115
			Winter VMT	13,685 (1,610/12,075)
Biochar Trips <sup>3</sup>		_		
Biochar Loads	1/1	53.4 (0/53.4)	53.5 (0/53.5)	107 (0/107)
		V	MT per Winter Day	107 (0/107)
			Operating Days	115
			Winter VMT	12,305 (0/12,305)
WINTER TOTAL				
		Total VMT po	er Winter Weekday	226 (14/212)
			Total Winter VMT	25,990 (1,610/24,380)
		тс	OTAL ANNUAL VMT	125,230 (38,330/86,900)

Notes: 1 Trips from South Lake Tahoe were assumed to originate at the US 50/Pioneer Trail intersection to represent the longest trip length, and therefore a conservative analysis.

<sup>&</sup>lt;sup>2</sup> Trips from Placer County and Nevada County were assumed to come from a location 20 miles away.

<sup>3</sup> Biochar trips will be to/from the Lockwood Landfill in Lockwood, Nevada.

Sources: Fehr & Peers, 2012

As shown in Table 8-9, the proposed project is expected to generate 827 new VMT per summer day, and 226 new VMT per winter day.

# 8.3.3 ISSUES OR POTENTIAL IMPACTS NOT DISCUSSED FURTHER

The project site is not located within two miles of a public or private airport; therefore, the project would not result in a change in air traffic patterns. This issue is not discussed further.

The project would not result in any changes to the existing roadway network; therefore, the project would not create any hazards caused by a design feature. This issue is not discussed further.

### 8.3.4 IMPACT ANALYSIS

Impact 8-1 **Intersection Level of Service Impacts.** The project's study intersection would operate at an acceptable LOS A with implementation of the project. Therefore, this impact would be **less than significant**.

As shown in Table 8-10, the proposed project would not cause the LOS at the study intersection to degrade to an unacceptable LOS. The project's intersection level of service impact would be **less than significant**.

Table 8-10	Existing Plus Project Intersection Level of Service Results					
		Friday PM Peak				
Intersection	Control Type <sup>1</sup>	Existing		Existing Plus Project		
		Delay <sup>2</sup>	LOS	Delay <sup>2</sup>	LOS	
SR 89/Cabin Creek Road	SSSC	1.1 (27.0)	A (D)	1.3 (28.1)	A (D)	

Notes: 1 SSSC = Side Street Stop Control

<sup>2</sup> Delay is reported in seconds per vehicle for the overall intersection (worst movement) for unsignalized intersections.

Sources: Fehr & Peers, 2012

Impact Traffic Signal Warrants Impacts. The study intersection would not meet criteria for installing a traffic signal. This impact would be less than significant.

The Federal Highway Administration (FHWA) provides standards for determining the need for installing a traffic signal in Chapter 4 of the Manual on Uniform Traffic Control Devices (MUTCD) (2009). Nine warrants are presented in the MUTCD. It is standard practice for traffic engineers often first check Warrant 3: Peak Hour. If this warrant is not met, it is unlikely that the other traffic volume-based warrants would be met. Therefore, the conclusion is that a traffic signal would not be warranted. The MUTCD provides the following guidance for evaluating the Peak Hour Signal Warrant:

The need for a traffic control signal shall be considered if an engineering study finds that the criteria in either of the following two categories are met:

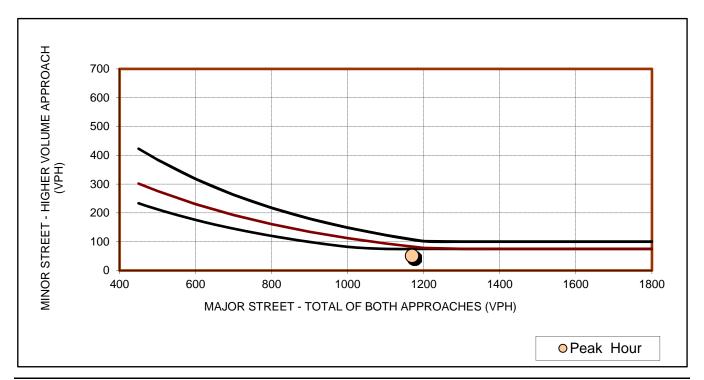
A. If all three of the following conditions exist for the same 1 hour (any four consecutive 15-minute periods) of an average day:

1. The total stopped time delay experienced by the traffic on one minor-street approach (one direction only) controlled by a STOP sign equals or exceeds: 4 vehicle-hours for a one-lane approach or 5 vehicle-hours for a two-lane approach; and

- 2. The volume on the same minor-street approach (one direction only) equals or exceeds 100 vehicles per hour for one moving lane of traffic or 150 vehicles per hour for two moving lanes; and
- The total entering volume serviced during the hour equals or exceeds 650 vehicles per hour for intersections with three approaches or 800 vehicles per hour for intersections with four or more approaches.
- B. The plotted point representing the vehicles per hour on the major street (total of both approaches) and the corresponding vehicles per hour on the higher-volume minor-street approach (one direction only) for 1 hour (any four consecutive 15-minute periods) of an average day falls above the applicable curve in Exhibit 8-7 for the existing combination of approach lanes. Note that if the posted or statutory speed limit or the 85th-percentile speed on the major street exceeds 40 mph or if the intersection lies within the built-up area of an isolated community having a population of less than 10,000.

Table 8-11 and the graph below display the results of Criteria A and Criteria B, respectively.

Table 8-11 Existing Conditions Peak Hour Signal Warrant Criteria A SR 89/Cabin Creek Road										ad
Scenario	Total Stopped Delay			Minor Street Volume			Total Entering Volume			Cuitorio
	Delay	Criteria	Criteria Met	Volume	Criteria	Criteria Met	Volume	Criteria	Criteria Met	- Criteria A Met
Existing Conditions	0.34 hours	4 hours	NO	45 vehicles	100 vehicles	NO	1,210 vehicles	650 vehicles	YES	NO
Existing Plus Project Conditions	0.40 hours	4 hours	NO	51 vehicles	100 vehicles	NO	1,220	650 vehicles	YES	NO
Source: Fehr & Peers, 2012										



The SR 89/Cabin Creek Road intersection would not meet Peak Hour Signal Warrant Criteria A or B with the proposed project. Therefore, this impact would be **less than significant**.

Impact 8-3 **Parking Impacts.** The project site plan includes adequate parking supply onsite to serve the demand generated by the project. This project would result in **less-than-significant** impacts.

The project would have a maximum of three employees onsite at any one time. The project site plan includes a minimum of eight parking spaces (including 1 wheelchair accessible parking space) which is adequate to serve project demands. This project's parking impacts would be **less than significant**.

#### Impact 8-4

**Transit Impacts.** Implementation of the proposed project would not affect transit facilities or transit service in the project vicinity because the project would not change existing transit service or facilities and would not significantly increase traffic delay on existing transit routes. This project's transit impacts would be **less than significant**.

Based on Exhibit 8-3 and 8-4, existing transit service is provided on SR 89. The proposed project would not change existing transit service or facilities, would not significantly increase traffic delay on existing transit routes, as demonstrated in the level of service analysis, and would not increase transit demand above current capacity. Further, because of the few employees that would be employed, the project would not result in a substantial demand for any transit services.

The project would be located adjacent to Tahoe Regional Transit Agency (TART) maintenance/storage facility. There are two project driveways proposed on the access road to the TART facility: one passenger car driveway that provides access to the biomass facility parking area and a truck driveway that provides access to the biomass fuel covered storage area. The passenger car driveway would be located within 50-feet of Cabin Creek Road. The traffic volumes at this driveway would be low, which is demonstrated by the trip generation estimates (12 daily employee trips and 3 peak hour trips) and would not affect transit vehicles traveling past the driveway to the TART facility. The truck driveway would be approximately 425 feet from Cabin Creek Road. This driveway would also have low traffic volumes (12 daily trips and 3 peak hour trips; half of total truck trip generation), and would not affect transit vehicles traveling past the driveway to the TART facility. Overall, the project's transit facilities and services impacts would be **less than significant**.

#### Impact 8-5

**Bicycle and Pedestrian Facility Impacts.** Because of limited employment opportunities and because the project is an industrial facility, it would not result in substantial demands for bicycle and pedestrian facilities. Further, the project would not result in any changes to existing pedestrian and bicycle facilities in the area. This impact would be **less than significant.** 

The project does not include any changes to existing bicycle and pedestrian facilities in the project vicinity. Further, because of the nature of the project, an industrial facility with only three employees onsite at any one time, it would not result in substantial demands for bicycle or pedestrian facilities. Therefore, the project's bicycle and pedestrian facility impacts would be **less than significant**.

### Impact 8-6

**Construction Traffic Impacts.** Construction activities and associated traffic would not cause the substantial deterioration of the LOS of surrounding roadways. The project's study intersection would continue to operate at an acceptable level at LOS A. Therefore, this impact would be **less than significant**.

Construction traffic would be present on the roadway network and at the study intersection during the 14-month construction period (which occurs over two construction seasons). Construction traffic would access the project site via SR 89 and Cabin Creek Road. Generally, for typical facility construction projects, the heaviest construction period occurs during site grading. The project would export approximately 12,000 cubic yards of material. Haul trucks can carry 20 cubic yards, resulting in 600 truck loads to remove the material over the grading duration. Based on a grading duration of 60 days, site grading would result in up to 10 truck loads per day, or 20 one-way trips per day (one trip in and one trip out for each truck). In addition, a maximum of 23 construction personnel would be at the site at any one time. Construction employees would generate approximately 46 vehicle trips. These trips in combination with truck trips would result in a total of 66 trips per day. All construction staging and parking would occur on site.

Construction activity would not generate traffic at levels that would cause any of the study area intersections to degrade intersection LOS. This impact would be **less than significant**.

#### Impact 8-7

**Access and Circulation Impacts.** The project would have adequately designed driveways and internal circulation roadways and would not affect circulation in the project vicinity. This impact would be **less than significant**.

The proposed project would have three driveways providing access to the site:

- Truck Driveway 1 located on Cabin Creek Road approximately 125 feet from the TART/County Facility access roadway.
- Truck Driveway 2 located on the TART/County Facility access roadway approximately 425 feet from Cabin Creek Road.
- Passenger Car Driveway, located on the TART/County Facility access roadway within 50 feet of Cabin Creek Road.

Cabin Creek Road provides access to the Eastern Regional MRF and Transfer Station, which is designed to accommodate ingress and egress of heavy vehicles. AutoTURN software was used to evaluate truck circulation throughout the project site. The software traces the path of a selected vehicle through a project site to ensure that the design is adequate. Based on the AutoTURN evaluation, the site would be designed to accommodate heavy vehicles and could adequately accommodate the design vehicle anticipated to be used to deliver fuel to the project site (i.e., 12.5 cubic yard capacity chip van/semi-tractor trailer). The AutoTURN graphic is provided in Appendix C. Therefore, the project's access and circulation impacts would be less than significant.

#### Impact 8-8

**Safety Impacts.** The proposed project would not affect safety in the project vicinity because the traffic volume generated by the project would be low and the LOS would not change; therefore, the existing lane configuration could adequately accommodate project-related traffic volumes. This impact would be **less than significant**.

The proposed project will utilize the existing roadway network to provide access to the project site. A left-turn pocket is provided at northbound approach of SR 89 to Cabin Creek Road. The project would generate one left-turning peak hour trip, which could be accommodated by the existing left-turn pocket. There is not a right-turn

pocket at the southbound approach of SR 89 to Cabin Creek Road. The proposed project would generate three peak hour trips at the southbound approach. This movement currently operates at LOS A and the delay/LOS would not change with implementation of the project. Because the traffic volume generated by the project would be low and the LOS would not change, the existing lane configuration could adequately accommodate project-related traffic volumes. This impact would be **less than significant**.

# 8.4 MITIGATION MEASURES

No mitigation measures are required.